TABLE OF CONTENTS

EX	ECUTIVE	SUMMARY	ES-1
	ES.1	Environmental Concerns Addressed by the Rule	ES-1
	ES.2	Statutory Background for the Rule	
	ES.3	Description of the Rule	
	ES.4	Baseline for the Analysis	ES-2
	ES.5	Potential Costs for Municipalities	ES-3
	ES.6	Potential Costs for Construction Operators	ES-3
	ES.7	Potential Costs for Federal and State Program Administrators	ES-4
	ES.8	Summary of Potential Costs	
	ES.9	Pollutant Loading Reductions from Municipalities	
	ES.10	Reduced Sediment Delivery from Phase II Construction Starts	ES-6
		Cost Effectiveness	
	ES.12	Anticipated Benefits of the Phase II Rule	ES-6
	ES.13	Benefits Estimation Comparison	. ES-13
		Comparison of Benefits and Costs	
	ES.15	Impact on Small Entities	. ES-14
	ES.16	No Exposure	. ES-15
1.0	INTROD	UCTION	1–1
	1.1	Statutory Background	1–1
	1.2	Description of the Rule	1–1
	1.3	Economic Analysis of the Rule	1–2
	1.4	Structure of the Report	1–3
2.0	ENVIRO	NMENTAL CONCERNS ADDRESSED BY THE RULE	2–1
	2.1	Storm Water Discharges from Urban Areas and Construction Sites	2-1
		2.1.1 Urban Area Storm Water Discharges	
		2.1.2 Construction Site Storm Water Discharges	2–2
	2.2	Potential Adverse Effects of Storm Water Discharges to Humans, Aquati	c
		Life, and Wildlife	2–2
		2.2.1 Human Health Impacts	2–3
		2.2.2 Aquatic Life and Wildlife Impacts	2–5
		2.2.3 Small Stream Impacts	2–9
	2.3	Summary	2–9
3.0	BASELIN	NE FOR ESTIMATING BENEFITS AND COSTS	3–1
	3.1	Existing Storm Water Programs	3–1
		3.1.1 Phase I Storm Water Program	3–1
		3.1.2 CZARA Program	
		3.1.3 State and Local Erosion and Sediment Control Programs	3–2
	3.2	Population	3–2
	3.3	Phase II Construction and Land Development Activities	
	3.4	Water Quality	
		3.4.1 Water Impaired by Urban Wet Weather Events	3–6
		3.4.2 Waters Impaired by Phase II Sources	3–8

4.0	3.5	Potential Limitations Associated with the Baseline Assumptions	3–10
4.0		ENTIAL COSTS, POLLUTANT LOAD REDUCTIONS, COST EFFECTIVENESS	1 1
	4.1	Overview of Methodology	
	4.1	4.1.1 Municipalities	
		•	
		4.1.2 Construction Site Runoff Controls	
		4.1.3 Post-Construction Runoff Controls	
	4.0	4.1.4 Phase I Industrial Activities	
	4.2	Analyses of Potential Costs	
		4.2.1 Municipal Costs	
		4.2.2 Construction Costs	
		4.2.3 Federal Costs	
		4.2.4 State Costs	
	4.3	Summary of Results	
	4.4	Potential Pollutant Loading Reductions Resulting from the Phase II Rule.	
		4.4.1 Pollutant Loading Reductions from Municipalities	
		4.4.2 Pollutant Loading Reductions from Phase II Construction Starts	
		4.4.3 Summary	
	4.5	Cost Effectiveness	
	4.6	Sensitivity Analyses	
	4.7	Conclusion	
5.0	QUALIT	TATIVE ASSESSMENT OF BENEFITS	5–1
	5.1	Municipal Minimum Measures	5–1
		5.1.1 Description of Measures	5–1
		5.1.2 Anticipated Benefits from the Municipal Minimum Measures	5–4
	5.2	Construction Site Controls	5-8
		5.2.1 Model of Construction Site BMP Effectiveness	5–8
		5.2.2 Anticipated Benefits of Construction Site Controls	5–9
	5.3	Conclusions	5–12
6.0	QUANT	TTATIVE ASSESSMENT OF BENEFITS	6–1
	6.1	Framework for Estimating Benefits	
		6.1.1 Definition of Benefit Categories	6–2
		6.1.2 How Benefits Arise from Water Quality Improvements	
	6.2	National Water Quality Model Approach	
		6.2.1 Potential Fresh Water Quality Improvements	
		6.2.2 Potential Value of Improved Fresh Waters	
		6.2.3 NWPCAM Sensitivity Analysis	
	6.3	National Water Quality Assessment Approach	
	0.5	6.3.1 Potential Benefits of Municipal Measures	
		6.3.2 Potential Benefits of Avoided Water Quality Impairments	
		6.3.3 Potential Value of Improved Marine Waters	
		6.3.4 Potential Benefits of Construction Site Controls	
		6.3.5 Summary of Benefits	
		6.3.6 Sensitivity Analysis	
		0.3.0 Schishivity Analysis	0–34

	6.4	Limitations and Uncertainties Associated with the Benefits Analyses	6–35
	6.5	Conclusion	6–37
7.0	COMPA	RISON OF BENEFITS AND COSTS	
	7.1	Total Annual Monetized Benefits	7–1
	7.2	Total Annual Monetized Costs	7–1
	7.3	Comparison of Benefits and Costs	7–2
8.0	REVISE	D SMALL ENTITY ASSESSMENT	
	8.1	Revised SBREFA Analysis of Impacts on Small Entities	8–1
		8.1.1 Background	8–2
		8.1.2 Small Entities Affected by Rule	8–3
		8.1.3 Compliance Requirements	8–4
		8.1.4 Revised Analysis of Potential Economic Impact	8–8
	8.2	Environmental Justice	8–15
	8.3	Unfunded Mandates	8–16
9.0	NO EXP	OSURE	9–1
	9.1	Background	9–1
	9.2	No Exposure Cost Savings	9–5
		9.2.1 Number of Facilities Eligible for the No Exposure Provision	9–6
		9.2.2 Industrial Facilities With and Without Exposure	9–8
		9.2.3 Industrial Compliance Cost Savings	9–8
		9.2.4 Total Industrial Cost Savings	9–13
	9.3	No Exposure Certification Cost	9–13
	9.4	Net Compliance Cost Savings	9–14
	9.5	State and Federal Costs	9–14
		9.5.1 Total State Costs	9–15
		9.5.2 Total Federal Costs	9–16
	9.6	Data Limitations	9–16
10.0) REFE	ERENCES	10–1

LIST OF APPENDICES

- Appendix A Literature Related to the Potential Impacts of Storm Water Discharges
- Appendix B Data and Methods Associated with the Municipal, Construction, and Post-Construction Programs
- Appendix C Supplemental Benefits Calculations
- Appendix D Data Associated with the Phase II No Exposure Provision
- Appendix E The National Water Pollution control Assessment Model

LIST OF EXHIBITS

Exhibit ES-1.	Potential Annual Costs for Phase II Storm Water Regulation ES-5
Exhibit ES-2.	Annual Local and Nonlocal Benefits Estimates Due to Phase II Controls ES-9
Exhibit ES-3.	Potential Annual Benefits of the Phase II Storm Water Rule ES-13
Exhibit ES-4.	Comparison of Annual Benefits to Costs for the Phase II
	Storm Water Rule ES-14
Exhibit 2–1.	Adverse Impacts Associated with Urban Runoff
Exhibit 2–2.	Five Leading Causes of Water Quality Impairment2–5
Exhibit 2–3.	Impacts Associated with Sediment and Sediment–Related Pollutants 2–6
Exhibit 3–1.	States and Territories Requiring Erosion and Sediment Controls at
	Construction Sites of Less than Five Acres
Exhibit 3–2.	Municipal Households Potentially Regulated Under the Phase II Rule 3–4
Exhibit 3–3.	Estimated Number of Total Construction Starts and Construction Starts
	Potentially Affected by the Phase II Soil Erosion Control Provision3–5
Exhibit 3–4.	Summary of Assessed Waters
Exhibit 3–5.	Summary of Assessed Waters by Designated Use
Exhibit 3–6.	Leading Sources of Water Quality Impairment Related to Human
	Development
Exhibit 3–7.	Major Impairment by Pollution Source
Exhibit 3–8.	Percentages of Waters Impaired by Storm Water Sources by Designated Use . 3–9
Exhibit 3–9.	Percent of Waterbody Impairment Potentially Attributable to Phase II
	Sources
Exhibit 4–1.	Annual Municipal Administrative Costs
Exhibit 4–2.	Mean and Percentage Findings:
	Estimated Annual Per Household Cost of Compliance for Phase II
	Municipalities
Exhibit 4–3.	Estimated National Phase II Municipal Annual Costs
Exhibit 4–4.	Summary Characteristics of Municipalities Where
	Construction Start Data was Collected
Exhibit 4–5.	Number of Construction Starts by Disturbed Area Size4–11
Exhibit 4–6.	BMPs Used for the Model Sites
Exhibit 4–7.	Description of BMPs Used for 27 Model Construction Sites
Exhibit 4–8.	Estimated Cost of BMPs for the Model Sites
Exhibit 4–9.	Storm Water Pollution Prevention Plan Requirements and
	Unit Cost Estimates
Exhibit 4–10.	Estimated Other Administrative Phase II
	Construction Costs Per Site
Exhibit 4–11.	Estimated National Phase II Construction Compliance Costs by
	Climatic Zones for Year 1998
Exhibit 4–12.	Phase II Erosion and Sediment Control Annual Costs
Exhibit 4–13.	Summary of Per-Site Average Total Costs by Acreage and by
	Percent Imperviousness
Exhibit 4–14.	Estimated Number of Construction Starts Potentially Affected by the

	Phase II Post-Construction Runoff Control Provision	
Exhibit 4–15.	Estimated Post-Construction Runoff Control Costs	4–22
Exhibit 4–16	Comparison of Site Development Costs Associated with Storm Water	
	Management: Conventional Development vs. Conservation Development	4–25
Exhibit 4–17	Estimated Range of Post-Construction Runoff Control Costs	
	Total Phase II Construction Program Costs	
	Estimated Federal Annual Costs	
	Estimated State Annual Costs	
	Potential Annual Costs for Phase II Storm Water Regulation	
	Estimated Ranges of Daily TSS Reductions from EPA's Phase I and	
	Phase II Storm Water Programs	4–29
Exhibit 4–23.	Estimated TSS Loading Reductions for Phase II Municipalities	
	Weighted Average Sediment Loadings and Loading Reductions (tons)	
	from Phase II Construction Sites of Medium Soil Erodibility	4–31
Exhibit 4–25.	National Reduction Estimates for Municipalities and	
	Construction Starts (tons/year)	4–31
Exhibit 4–26a.	Results of Sensitivity Analysis for Scenario One	
	. Results of Sensitivity Analysis for Scenario Two	
	Results of Sensitivity Analysis for Scenario Three	
	Results of Sensitivity Analysis for Scenario Four	
	Results of Sensitivity Analysis for Scenario Five	
	Results of Sensitivity Analysis for Scenario Six	
Exhibit 6–1.	Potential Benefits of Water Quality Improvements	
Exhibit 6–2.	The Production of Benefits from Improved Ambient Water Quality	
Exhibit 6–3.	NWPCAM Water Quality Ladder	
Exhibit 6–4.	NWPCAM Summary of Key Model Assumptions for the Storm Water	
	Phase II Benefits Analysis	6–9
Exhibit 6–5.	Summary of Miles Meeting Designated Uses Under Baseline and	
	Scenario Phase II Conditions	6–10
Exhibit 6–6.	Mean Annual Household WTP Amounts for Different Levels of	
		6–12
Exhibit 6–7.	Local and Nonlocal Benefits of Phase II Controls Estimated Using the	
	NWPCAM	6–13
Exhibit 6–8.	Potential Annual WTP Estimates for Fresh Water Impaired by	
	Phase II Municipal Sources	6–16
Exhibit 6–9.	Potential Annual Benefits of Improving Fresh Water Impaired by	
	Phase II Municipal Sources to Support Their Designated Uses	6–16
Exhibit 6–10.	Mean Contaminant Concentrations in Storm Water Runoff from	
	Developed and Nonurbanized Areas	6–17
Exhibit 6–11.	Effectiveness of BMPs in Removing Contaminants from Storm Water	
	Runoff	6–18
Exhibit 6–12.	Potential Annual WTP Estimates for Fresh Water Impaired by One	
	Year of New Development and Redevelopment Activities	6–19

Exhibit 6–13.	Potential Annual Benefits of Avoiding Future Fresh Water Impairments from New Development and Redevelopment Activities in Phase II	
Exhibit 6–14.	Urbanized Areas	6–21
	in Phase II Communities	6-24
Exhibit 6–15.	Cost of Illness Estimates for Gastrointestinal Illnesses	
	Summary of Potential Marine Health Benefits by Symptom, Exposure	
	Assumption, and Total Coliform Concentration at Outfall	6-27
Exhibit 6–17.	Potential Annual Benefits of Avoided Health Impacts from Swimming in	
	Contaminated Marine Waters in Phase II Communities	6-27
Exhibit 6–18.	Potential Annual WTP for the Phase II Soil and Erosion Control Program	6-31
	Assumptions Used to Derive Perimeter Shares	
Exhibit 6–20.	Potential Annual Benefits of the Phase II Storm Water Rule	6-34
	Results of Sensitivity Analysis	
Exhibit 6–22.	Key Limitations and Uncertainties in the Benefits Analysis	6-36
Exhibit 7–1.		
Exhibit 8–1.	Businesses and Municipalities Potentially Affected by the Phase II Storm	
	Water Regulations	. 8–4
Exhibit 8–2.	Summary of Compliance Requirements and Estimated Costs of the Phase II	
	Storm Water Rule for Small Municipalities and Building Contractors	. 8–6
Exhibit 8–3.	Revenue Test for Small Municipalities	. 8–9
Exhibit 8–4.	Construction Start and Per-Home Compliance Costs by Site Size	8-10
Exhibit 8–5.	Per-Home Compliance Costs as a Percent of Median and Mean Home Sale Price	8_10
Exhibit 8–6.	Best Management Practice Costs per Construction Site	
Exhibit 8–7.	Estimated Number of Multi-Family Residencies per Start by Site Size	
Exhibit 8–8.	Estimated Multi-Family Residential Sales and Compliance Costs by	0 12
Exmort o o.	Site Size	8_13
Exhibit 8–9.	Estimated Commercial Office Space Sales and Compliance Costs by	0 13
Zimion o j.	Site Size	8–14
Exhibit 9–1.	Industrial Facilities That Must Submit Applications for Storm Water	0 1.
	Permits (Phase I)	. 9–3
Exhibit 9–2.	Total Facilities and Estimated Number of Regulated Industrial	
	Facilities in Selected States	. 9–7
Exhibit 9–3.	Estimated Number of Regulated Industrial Facilities	
	With and Without Exposure	. 9_9
Exhibit 9–4.	Estimated Industrial Pollution Prevention Costs for All Regulated	
	Facilities	9–10
Exhibit 9–5.	Estimated Incremental Industrial Pollution Prevention Costs for	
	EPCRA Facilities	9-10
Exhibit 9–6.	Estimated Annual cost Savings per Facility	
Exhibit 9–7.	Adjusted Annual Cost Savings per Facility	
Exhibit 9–8.	State Costs to Implement the Industrial No Exposure Provision	
Exhibit 9–9.	Federal Costs to Implement the Industrial No Exposure Provision	